Assignment: module -5 Network Fundamentals and Building Networks

**Section 1: Multiple Choice**

1. What is the primary function of a router in a computer network?

a) Assigning IP addresses to devices

b) Providing wireless connectivity to devices

**c) Forwarding data packets between networks**

d) Managing user authentication and access control

2. What is the purpose of DHCP (Dynamic Host Configuration Protocol) in a computer network?

a) Assigning static IP addresses to devices

b) Resolving domain names to IP addresses

c) Managing network traffic and congestion

**d) Dynamically assigning IP addresses to devices**

3. Which network device operates at Layer 2 (Data Link Layer) of the OSI model and forwards data packets based on MAC addresses?

a) Router

**b) Switch**

c) Hub

d) Repeater

4. Which network topology connects all devices in a linear fashion, with each device connected to a central cable or backbone?

a) Star

**b) Bus**

c) Ring

d) Mesh

**Section 2: True or False**

1. True or False: A VLAN (Virtual Local Area Network) allows network administrators to logically segment a single physical network into multiple virtual networks, each with its own broadcast domain. **True**

2. True or False: TCP (Transmission Control Protocol) is a connectionless protocol that provides reliable, ordered, and error-checked delivery of data packets over a network. **False**

3. True or False: A firewall is a hardware or software-based security system that monitors and controls incoming and outgoing network traffic based on predetermined security rules. **True**

**Section 3: Short answers**

4. Describe the steps involved in setting up a wireless network for a small office or home office (SOHO) environment.

**ANS**.

To set up a wireless network for a small office or home office (SOHO) environment, follow these steps:

1. **Choose a Wireless Router**: Select a suitable wireless router that meets your speed and coverage requirements.
2. **Connect the Router**: Connect the router to your modem using an Ethernet cable. Plug in the router and power it on.
3. **Access Router Settings**: Connect a computer to the router via Ethernet or wirelessly. Open a web browser and enter the router’s IP address to access the settings (usually found in the router’s manual).
4. **Configure Network Settings**: Set up the wireless network name (SSID) and password. Choose WPA3 or WPA2 for security.
5. **Adjust Additional Settings**: Configure other settings as needed, such as guest networks, parental controls, or DHCP options.
6. **Update Firmware**: Check for firmware updates for the router and install them to ensure optimal performance and security.
7. **Connect Devices**: Connect your devices (laptops, smartphones, printers) to the new wireless network using the SSID and password.
8. **Test the Connection**: Ensure all devices can connect to the internet and access the network resources.
9. **Secure the Network**: Change default admin passwords and enable any additional security features offered by the router.

**Section 4: Practical**

1. Demonstrate how to configure a router for Internet access using DHCP (Dynamic Host Configuration Protocol).

**ANS. Done in class**

**Section 5: Essay**

10. Discuss the importance of network documentation in the context of building and managing networks.

ANS.

Network documentation is crucial in building and managing networks for several reasons:

1. **Clarity and Understanding**: Comprehensive documentation provides a clear overview of the network architecture, including diagrams of network topology, device configurations, and IP address assignments. This clarity aids in understanding how the network operates.
2. **Efficient Troubleshooting**: Well-documented networks facilitate quicker identification of issues. When problems arise, having a record of configurations, network paths, and device settings enables support teams to diagnose and resolve issues more efficiently.
3. **Change Management**: Documentation helps track changes made to the network, such as hardware upgrades or configuration modifications. This is essential for ensuring consistency and understanding the impact of changes.
4. **Onboarding and Training**: New team members can benefit from detailed documentation, which serves as a training tool. It helps them understand the network’s structure, processes, and best practices more quickly.
5. **Compliance and Security**: Many industries have regulatory requirements for maintaining accurate records of network configurations and security measures. Proper documentation aids in compliance and helps in auditing processes.
6. **Disaster Recovery**: In case of network failures or disasters, documentation provides a roadmap for restoring services and configurations. This minimizes downtime and speeds up recovery efforts.
7. **Planning and Scalability**: Documenting current network resources and configurations aids in future planning. It helps assess how to scale the network, integrate new technologies, or accommodate growth.
8. **Collaboration**: Clear documentation promotes better communication among team members and departments. It ensures everyone is on the same page regarding network operations and policies.